



THOMAS G. NEWMAN, Editor.

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**May Sun** is bright—the air is clear,  
The darting swallows soar and sing,  
And from the stately elms I hear  
Blue-birds and bees salute the spring.

We Regret to learn that Mr. C. Schindler, of Perryville, Mo., lost his wife and child on the 6th ult. This leaves him with four small, motherless children to care for. We condole with him in his affliction.

A Great Bee Show will be held at Vienna, with the main object of establishing a honey market for the convenience of the inhabitants of the Austrian capital, and a means of facilitating the sale of honey now being produced in that country.

**A. O. Crawford**, South Weymouth, Mass., has sent us his new Carton case for a one-pound section of comb honey. It has a piece of mica covering a hole (nearly 2 inches) through which the honey can be seen. It is a nice thing for grocers' shelves to keep the honey clean, and yet show it to customers.

**Apiculture at Cornell University.**—A course in apiculture under Prof. Comstock has just been added to the regular work. This course is intended to supplement the Professor's lectures on the subject. Each student is given a colony of bees, and is expected to attend to it himself. The bees given to the students are Italians, and are the property of Prof. Comstock. The students taking this course have just had some practical work. A swarm of black bees had taken possession of a tree near Fall Creek, just opposite the Professor's house, and had to be taken care of to prevent them from hybridizing the Italians. The tree was cut down, the bees hived, their queen and drones destroyed, and an Italian queen given to them, making them now harmless neighbors.

Thus it will be seen that progressive and scientific apiculture is now being taught as a practical pursuit in several of the colleges of America.

**Indiana** now presents a case of antagonism to apiculture. Mr. F. C. Barrett writes to us that the City Council of Fort Wayne, Ind., has passed the following ordinance against bee-keeping :

**BEEES**—It shall be unlawful for any person to keep within the limits of the city, more than two hives of bees upon any one lot at a time, and said hives must not be nearer than 50 feet to any street, or 20 feet to any alley, or division line between lots or parts of lots of another. Any person who shall violate any or either of the provisions of this chapter, or any section, clause or provision of any section of this chapter, or who shall neglect or fail to comply with any or either of the requirements thereof, shall, on conviction, forfeit and pay a fine of not more than one hundred dollars.

This ordinance practically wipes out the pursuit of bee-keeping within the corporate limits of Fort Wayne—if it is enforced.

Of course a similar plan may be pursued to the one in Arkansas, mentioned last week on page 307. So far we are not advised as to the result of the trial, which was expected to take place on the 16th inst. We await that news almost impatiently.

**LATER.**—Since the above was put "in type," we have another letter from Mr. Barrett, stating that a bee-keeper being arrested there, it was rumored that it was under the provisions of the above ordinance; but, upon examination, it proved otherwise. Such a pressure is being brought to bear upon the City Council, that it is expected that it will repeal the obnoxious ordinance at the next meeting.

**Bee-Keeping in Russia.**—Mr. G. Kandratieff, has 500 colonies of bees, and has just visited Italy in order to study the apicultural methods of that country. One of his apiaries containing 300 colonies is located in the Caucasus, and the other of 200 colonies is located in St. Petersburg. The Italian bee-periodical *L'Apicoltore* says:

According to the *Apicoltore*, Mr. G. Kandratieff, Director of the Imperial Opera of St. Petersburg, has availed himself of a short visit in Italy in order to make an inspection of the most important apiaries. Mr. Kandratieff is the proprietor of two large apiaries in Russia, one of about 300 colonies in the Caucasus, and another of about 200 in St. Petersburg. Notwithstanding the great difference of climate between the Caucasus, where winter is almost unknown, and St. Petersburg, where it is both most severe and long, Mr. Kandratieff obtains, it appears, almost the same amount of profit in proportion from the one as from the other. It appears that Mr. Kandratieff is a perfect master of the Italian language, and a constant reader of the *Apicoltore*, which has been his guide in his apicultural pursuits.

**More Rain Needed.**—Dr. C. C. Miller, Marengo, Ills., writes on May 17, 1887: "Bees are doing nicely, but unless we have rain soon there must be a failure of the clover crop here."

Here in Chicago we have had several good rains, and things are consequently looking prosperous, but in many parts of the country rain has been much needed for several weeks. Now, however, the scene has changed; for the past three days copious showers all over the northwest have revived vegetation, and good crops are now assured.

**F. H. Scattergood's** price-list of Italian queens is received on a postal card from Winona, O.

**Foolish Warfare Against Bees** seems now the rage! The idea that fruit suffers because of the presence of bees is simply ridiculous! The good they do in fertilizing the fruit trees far outweighs any possible evil that may follow from their presence.

Some time ago we noted the fact that in New England, so strong was the belief that bees injured the fruit, that an ordinance was passed obliging the bee-keepers to remove their bees to another locality. After a year or two the fruit-growers decided to have the bees brought back, as so little fruit set upon the trees in proportion to the blossoms which appeared!

While the "good" the bees are doing to fruit is so apparent, and most fully demonstrated, the injury to fruit charged against them in the work of other insects and birds, and is a senseless and ignorant howl by those who know nothing of the possibilities of the bees' organism, and vehemently charge the bees with puncturing fruit when their jaws are too weak to puncture the skin of the most delicate grape. All the bees do is to gather up the juice after the damage is done, and save what is going to waste! All bee-keepers wish they would even leave that juice ungathered.

**The Flavor of Honey.**—Mr. G. W. Brodbeck writes as follows on this subject in *Gleanings*:

In all discussions in regard to ripening honey, one essential fact has been entirely ignored, and yet the quality, if not entirely, is more dependent on it than on any other. That honey must be of a certain consistency is conceded by all; so quality first, and quantity next, is what we are all in pursuit of; and how to get the latter without failure of the first, is yet an open question. Admitting proper consistency, quality, then, is due to its peculiar flavor, which is derived from the nectar of the flower.

All flowers and plants possess a peculiar and distinct odor, which is due to a volatile, or essential oil, peculiar to itself, and this oil we find in the nectar of the flowers; this it is that gives honey its distinct flavor. When flowers are macerated in water, then distilled, the essential oil of the flower passes off with the steam, and, if condensed, the oil is found in minute quantities floating on the water; and this, as its name indicates, is very volatile, and, if exposed to the atmosphere, in time all evaporates. Thus the flavor of the honey is dependent on the quantity of this oil present in it. Some flowers possess more of it than others; and, as a natural result, we find some honey with more of a distinct flavor. If the retention of this oil is desirable, then that method by which there is the least loss in the one we are in search of. That we have not yet attained this, is evidently a fact; but that it is attainable is beyond question, and I doubt not but that careful experimenting will yet give us a standard to go by.

We have Received the Illustrated Catalogue of G. Stoddard, of Welwyn, Herts, England. It contains 48 pages descriptive of his stock of bee-keepers' supplies.

**Warm Days** tell us of approaching summer, and an article that takes us to the woods and mountains has an attractive appearance. Mr. Charles Bacon allures us all to follow him in his sketch, "Camp-Life Among the White Hills," in *Frank Leslie's Popular Monthly* for June. Miss Lily Higgins tells something about the "Jubilee of Queen Victoria." The many articles are all well illustrated, and the stories, six in number, are very clever and worth reading. The whole number is most attractive in matter and picturesque effect.

## QUERIES

With Replies thereto.

[It is quite useless to ask for answers to Queries in this Department in less time than one month. They have to wait their turn, be put in type, and sent in about a dozen at a time to each of those who answer them; get them returned, and then find space for them in the JOURNAL. If you are in a "hurry" for replies, do not ask for them to be inserted here.—ED.]

### Rearing Queens and Italianizing.

**Query 421.**—I want to Italianize my apiary the coming season, rear my own queens from an imported mother, and work my apiary for comb honey. What is the best way to proceed, and at the same time procure the best results in honey, with no desire to rear queens for sale?—L. R. W. VA.

This is like asking a carpenter how to build a house.—JAMES HEDDON.

I should proceed as recommended by Mr. Hutchinson in his new book; then rear queens from Italian stock, and supersede by use of these.—A. J. COOK.

Have queen-cells built in full colonies, transfer them to nuclei, and when the queens are laying, introduce them to the full colonies.—W. Z. HUTCHINSON.

This space is too small to give any good method. Procure "Bees and Honey," read it carefully, and you will obtain the information you want.—H. D. CUTTING.

As Prof. Cook says, "Consult the books," and back numbers of the BEE JOURNAL, and you will probably find better answers than I can give. Queen-rearing must interfere with honey-gathering to some extent.—C. W. DAYTON.

Set aside a few colonies for the purpose of rearing queens, and then proceed according to the rules laid down in any standard work on bee-keeping.—J. P. H. BROWN.

Form as many nuclei as you think you will need, and as fast as you get queens to laying in them, introduce them to your full colonies, using the same nuclei till the required amount of queens are secured.—G. M. DOOLITTLE.

I am not sure that I know the best way for any one, and without knowing your experience, etc., I could not say what would be best for you. One good way might be to rear queens at the beginning of the honey harvest, and then as fast as swarms issue, give queens or queen-cells to the colony in the old hive, and change the old queen toward the close of the harvest.—C. C. MILLER.

In my locality it interferes less with the honey-field to change the queens at the close of the honey season. I sometimes rear the queens in nuclei and introduce them, but more frequently I remove the black queen and give the colony a maturing queen-cell, 3 days after removing the queen.

Last season I introduced hundreds of virgin queens after the colonies had been queenless 3 or 4 days, by caging some of them and leaving the bees to release them by eating away the plug of soft candy with which the cage was stopped, and by simply running them in at the entrance of the hives.—G. W. DEMAREE.

Break up enough colonies into nuclei to give you the number of queens you want. Then rear a lot of queen-cells in a full colony; when they are sealed transfer them to the nuclei to come out from the cells, and to fly on their wedding tour. Let the colony the queens are reared from have from ten days to two weeks rest before rearing a second lot of cells; and three weeks, sure, again before rearing the third. Be sure and keep the air full of drones during the mating season.—J. E. POND.

I would not Italianize and try to work for comb honey at one and the same time, except to introduce queen-cells to all colonies casting swarms, if convenient. After the principal honey flow has ceased is the best time to Italianize, in my experience. Then take out all undesirable queens, and on the third day after take out the larvae of the queen-cells and introduce very small larvae from the select stock; mark the cells, and afterwards destroy the other cells made. Another good plan is to take out the queens, and in nine days all the cells, then introduce just hatching larvae in a bit of comb, and let each colony rear a queen.—G. L. TINKER.

To Italianize an apiary, it will be necessary to catch and destroy all the drones, or the young queens you propose to rear will be impurely mated. Take away the queens to be superseded, and after 24 hours cage the Italian queen and insert it between two combs containing honey, which the queen may be able to reach at pleasure. In about 48 hours release the queen upon one of the combs. If she is molested by the bees, return her to the cage for another 36 hours, after which she will no doubt be accepted. If queen-cells have been started, destroy them. This need not interfere with honey-gathering to any great extent. There are other methods, and it will be well to consult Alley's book on queen-rearing. Select a method, and then follow the directions given.—THE EDITOR.

### Worker-Comb and Drone-Eggs.

**Query 422.**—If an 8-frame Langstroth hive is filled with all worker-comb, and no drones hatch during the season, what becomes of the drone eggs, if it is not the size of the cell that causes the impregnation of the egg?—G. P.

They remain unlaid.—C. W. DAYTON

I suppose the drone-eggs in that case are all impregnated and become worker eggs.—C. C. MILLER.

According to our best authorities, the eggs are all alike until impregnated, then they produce workers; otherwise they produce drones.—W. Z. HUTCHINSON.

Your "if" is hardly possible. I have yet to see a strong colony pass the swarming season without drone-brood.—G. M. DOOLITTLE.

There are no drone-eggs laid, that's all. If you imagine that a queen has a certain number of drone-eggs to lay in a season, you had better read what the modern writers say about parthenogenesis.—DADANT & SON.

It is bee-nature to rear some drones during the swarming season, and to accomplish this object they will alter and change worker-cells around the margin of the comb into drone.—J. P. H. BROWN.

I have never seen any trouble about bees rearing drones in worker-cells when they have no drone-cells. Drone-eggs, if they hatch and mature, make nothing but drones in all cases. I do not think the size of the cells has anything to do with the impregnation of the eggs.—G. L. TINKER.

All I know about it is, that where I have no drone-comb in my hives, I see no drones in the hive at any time of the year. I was not aware that any "drone-eggs" were laid.—JAMES HEDDON.

I presume that there are no drone-eggs to "become of," if the queen has none but worker-cells to lay in. I know that queens can lay eggs that hatch out drones, in worker-cells, for I have seen the like several times. I think that the preponderance of the evidence is on the side of the theory that the queen lays male and female eggs at her own option. Still I believe the matter has never been demonstrated.—G. W. DEMAREE.

If there is no place for drone-cells, you will have no drone-eggs, unless the hive contains an old queen; then they will make a place for drone-cells. The size of the cell has nothing to do with the impregnation of the egg. In other words, if there are no drone-cells to put drone-eggs into, all the eggs will be impregnated by the queen and produce workers.—H. D. CUTTING.

They are deposited in worker-cells, and the drones emerge therefrom the same as from drone-cells, but are much smaller. There is no difficulty in the matter at all. Every bee-keeper of experience has seen drones emerge from worker-cells, and thousands of them also at times; this particularly where a virgin queen has been kept for experimental purposes.—J. E. POND.

I should say that the queen controls this matter, and knows better than to lay drone-eggs in worker-cells, and so she lays no drone-eggs in the case mentioned. The fact so often witnessed, of a queen laying worker-eggs in cells but partially completed, sometimes only just fairly commenced, utterly refutes, it seems to me, the compression theory.—A. J. COOK.

Before impregnation occurs the eggs are all alike; after that they produce worker bees. If no drone-comb is provided, the queen impregnates the eggs and uses the worker-cells. This shows the value of using

full sheets of comb foundation in the brood-chamber—to prevent an excess of drones.—THE EDITOR.

### Honey for Bees in Winter.

**Query 423.**—Having a few light colonies of bees last fall, I gave each full combs of honey from other colonies, and put them into the cellar on Nov. 19. Upon examination recently, I found the combs filthy with the excrement of the bees, with lots of honey in the hive, but the bees were dead. Is it practical to winter bees in solitary confinement on honey gathered by other colonies? —B. S., New York.

Yes.—G. L. TINKER.

It is practical in many cases. Read my article on page 184, in regard to small colonies.—C. W. DAYTON.

I should say the temperature of your cellar was not high enough, rather than a fault of the honey.—G. M. DOOLITTLE.

It is practicable to winter bees on combs of honey gathered by other bees, but weak colonies are liable to dwindle and perish with the best of stores, if the cold is protracted.—J. P. H. BROWN.

I do not understand your meaning of "solitary confinement." Bees will winter on good honey whether they or some other colony gathered it.—H. D. CUTTING.

The honey of other colonies has nothing to do with the question, if it is wholesome. But outside of this the circumstances in which your bees were placed may have been unfavorable. We could not say what was wrong, unless we were acquainted with all the particulars.—DADANT & SON.

Most assuredly; I have done it repeatedly. The probable reason of your loss is that your cellar was too cold, and your bees to few in numbers.—A. J. COOK.

The bees died with the diarrhea. That the honey was gathered by other colonies probably made no difference. Perhaps they were not strong enough in numbers to keep up the requisite heat.—W. Z. HUTCHINSON.

I am not sure I understand the question, but I believe that combs of honey upon which the bees that gathered it would winter well, would be just as good for any other colony.—C. MILLER.

To the last part of your question I say yes, most certainly so. But if you give the bees a new supply of stores and put them in confinement at once, they are likely to gorge themselves to their ruin, unless they can have a flight in the open air till they resume a normal condition. Continued confinement with low temperature will destroy any colony of bees, but conditions may vary the time all the way from successful wintering to the worst sort of failures.—G. W. DEMAREE.

Yes! most certainly, if preparation is made at the proper time. Honey is honey; comb is comb, and bees utilize both at all times, whether their own or of other colonies. You must look deeper for the source of

your troubles. You do not say that it is so, but I judge that you put the bees on strange combs on the day you put them into the cellar. If such was the case, it should have been expected the bees would die, as they had no opportunity to construct a brood-nest before cold weather.—J. E. POND.

Your bees have that disease known as bee-diarrhea. It was not caused by "solitary confinement," nor the transferred honey. It was caused by the consumption of pollen, and that consumption was caused by some condition present with your colonies, which is not known to me.—JAMES HEDDON.

"Solitary confinement" may do for criminals; but for bees, never. They need company for warmth. It makes no difference as to what bees gathered the honey, so long as it is "come-at-able" for the nourishment of bees in winter quarters. Your colonies were evidently too "weak" to keep up the necessary temperature, and therefore "succumbed to the inevitable."—THE EDITOR.

### Housekeeper.

### Weighing the Baby.

EUGENE SECOR.

"The baby is three months old to-day;  
We want to see what the cherub will weigh—  
So if papa has leisure,  
I know he'll take pleasure  
In bringing the scales containing the tray."

"Twas mamma, who thus from my book  
Enticed me, with speech and with look  
So happy, so winning,  
I had surely been smitten,  
Had I not left, with pleasure, my nook.

"The clumsy scales to the room were brought;  
The same by which fish and potatoes were bought.  
As if, in one measure,  
And just at one's pleasure,  
A bushel of turnips could balance a thought.

"As if with grocers' scales could be weighed  
A sunbeam, a joy—or a reckoning made  
In pounds, to a fraction,  
Of the subtle attraction  
Of a lily, in all its beauty arrayed!

"The treasure was wrapped in mamma's shawl,  
The little pink toes and fingers and all—  
'Twould not do to chill her  
With the scales from the cellar—  
For 'twas cold, cold weather late in the fall.

"The balance was turned at ten and four,  
Nor could we make it a fraction more;  
When she looked up so smiling,  
So bewitching, beguiling,  
That in our estimation the weight was fourscore.

"Then for those dimples add at least eight,  
For blue eyes that twinkle a sum twice as great;  
To the crowing and cooing—  
Like wood-peacocks wooing—  
Add the charms unseen that to mama have weight.

"And what do you guess is the total amount?  
Tis a sum too large for papa to count.  
So back with these cumbersome  
Scales to the lumber room—  
To weigh Heaven's gifts they're just no account.

Forest City, Iowa.

### Convention Notices.

**F** The next meeting of the Darke County Union Bee-Keepers' Society will be held at Greenville, O., on Friday, May 27, 1887.

J. A. ROX, Asst. Sec.

**F** The next meeting of the West Lake Shore Central Bee-Keepers' Association will be held on May 26, 1887, in Koekring Hall, at Kiel, Wis.

FRED ZASTROW, Sec.

**F** The Boone and Hendricks Counties Bee-Keepers' Association meets at John Ridgway's, southwest of Brownsburg, Ind., on Thursday, June 2, 1887. All are invited to come with baskets well filled, and have a nice time.

A. COX, Chairman Committee.

### Correspondence.

This mark **O** indicates that the apistar is located near the center of the State named; **♂** north of the center; **♀** south; **♂** east; **♀** west; and this **♂** northeast; **♀** northwest; **♂** southeast; and **♀** southwest of the center of the State mentioned.

For the American Bee Journal.

### Contraction of the Brood-Nest.

W. Z. HUTCHINSON.

On page 278, Mr. Demaree, in speaking of the contraction system, says: "Such treatment would bring ruin to my apiary in an average season, unless I should feed the colonies through the heated months of summer, and supply them with winter stores again in the fall, in which case I would lose rather than gain by the operation."

Farther on he says that "to so manipulate the hive arrangements as to throw all the honey into the 'surplus' costs the life of the colony. Now, if we feed back to counteract the loss on the side of the bees, we have gained nothing—nay, lost in the operation."

Let us consider for a moment what contraction of the brood-nest really does. Perhaps I cannot explain the matter more clearly than I have in "The Production of Comb Honey." I quote as follows: "To rear the great army of workers needed for the harvest, there must be, in the fore-part of the season, a good-sized brood-nest—not larger, however, than an ordinarily prolific queen will keep well filled with brood—but when the bountiful harvest has finally arrived, then we wish the *now existing* workers to go into the *fields*, to gather in the nectar and cure and seal it, instead of wasting their time, vitality and stores in rearing another army of workers that will come upon the field when the harvest is over and gone. Fortunately, our desire and the bees' instinct are exactly parallel in this instance. Give a swarm a large brood-nest and the bees will fill it—partly with brood, but mostly with honey; put a swarm into a hive with a small brood-chamber, allow the bees to build their own combs therein, at the same time give them access to a super furnished with comb, and they will fill the super with honey, and the brood-nest—slightly with honey, but mostly with brood."

Contraction carried to an extreme will curtail the production of brood, but increase the *immediate* production of honey; moderately employed, it will not lessen the rearing of brood nor augment the amount of honey, but effects a comparatively complete separation of brood and honey; i. e., the brood will be in one apartment and the honey in another. This is what contraction does, it secures nearly all of the white honey in the most marketable shape, leaving the brood-nest filled with brood instead

of honey. Now what is there about this that will "ruin an apiary in an average season," or that "costs the life of a colony?" Just as much, or, at least nearly as much brood has been reared, and the only difference is that the honey has been stored above the brood-nest instead of in it. What is there about this that is detrimental to the "life of the colony?" There are just as many, or at least sufficient bees, and they are healthy and strong, and exactly as good in every respect as though they had stored all their honey in the brood-nest. Why then say: "The apiary is ruined?"

Of course they must be furnished with food. There is usually enough in the corners of the frames to last them until fall. I have been practicing the contraction system now for four years, contracting to five Langstroth frames or their equivalent, and have never yet been obliged to feed my bees through "the heated months of summer." Before cold weather sets in, all that is necessary is to put on feeders and feed sugar syrup, which is not only unvarying in character, but as a winter food for bees is equal, if not superior to the best honey; and at present prices, can be used at a profit. And right here I wish to again quote from "The Production of Comb Honey:"

"Those who for any reason do not wish to use sugar, may still take advantage of this system by putting the unfinished sections back on the hives in time for the honey to be carried down and stored in the brood-nest for winter.... As some may ask what is to be gained by this management, I will explain that the number of finished sections is increased thereby; in other words, it enables us to virtually exchange the honey in our unfinished sections for nearly its weight in finished sections, leaving us the combs to give the bees a 'send off' in the spring."

I do not say it boastfully, but few bee-keepers have experimented more than myself in "feeding back" extracted honey, and one thing that I have discovered is, that the loss in weight, when the bees have empty combs in which to store it, is comparatively slight. If the bees have to construct combs in which to store the honey, there is then a decided loss in weight, so much so that it is unprofitable. When bees are gathering honey in the fields, there are times when they may build combs to advantage, but when they get their honey from a feeder, paradoxical as it may appear, they must have combs in which to store it, if the work is done at a profit.

The idea advanced by Mr. Demaree, that the labor and excitement caused by feeding the bees for winter causes a great loss of life and vitality, does not agree with my experience. The feeding of from 10 to 15 pounds of syrup occupies, upon an average, about two days' time; it is done at a season when brood-rearing is on the wane; and it is so soon over that it has no great stimulating effect; but, far better than all theorizing, colonies so treated winter better, as a rule,

than those that have nothing but natural stores. Each year I have left some colonies uncontracted and unfed, and they have shown no superiority over those that had been contracted and fed in the fall, while the profits have been considerably less. My only object in leaving some colonies in this manner was to make a comparison. A neighbor living two and one-half miles away, who did not "believe in contraction," nor in "starters only," bought my empty combs one year ago, and hived his swarms in 10-frame Langstroth brood-nest, and left his bees their natural stores, now mourns over a loss nearly twice as great as my own.

Mr. Demaree says: "But when it comes to running an apiary from year to year as a business, comb foundation and empty combs cannot be dispensed with in the majority of the apiaries in the country, and their judicious use must be profitable everywhere." (Italics mine.) Although this was probably intended as a criticism, I must say that I agree with him entirely. So many seem to misunderstand my views upon this subject; they seem to think I would banish foundation and empty combs, while I only plead for a "judicious" use of them, and it was to make clear what I considered, and what my experience taught, was a judicious use of them, that I wrote my little book, the last paragraph of which, preceding the "Conclusion," reads as follows:

"In my locality, and with my management (and I can see no reason why the same rules and laws will not hold good in other localities), I know that the use of full sheets of foundation in the brood-nest, when hiving swarms, is attended with loss; and I do not think the matter stops here. I think there are still more advantages to be gained by utilizing the natural wax secretion, and it is possible that it would be profitable to encourage wax secretion and comb-building. What is needed is, I believe, an abundance of empty comb in the supers at all times, and the bees at the same time allowed to indulge in comb-building."

Rogersville, & Mich.

For the American Bee Journal.

### Shipping Honey to Commission Men.

MRS. L. C. AXTELL.

We have for perhaps ten years shipped honey to Chicago to be sold by commission men. One year 30,000 pounds went from our apiary to Chicago. In our state of health it is almost impossible to sell all our honey at home, but Mr. Axtell and I believe in developing our home market all we possibly can.

As to commission men, I fear we think too harshly of them. No doubt some of them are dishonest, as there are those in all kinds of business who are dishonest; but there are good, Christian commission men, as well as rogues. Send your honey to them, or to men with a good reputation, and if

you should fail in getting returns in time, get a competent lawyer to collect for you, with an understanding that he shall have such a per cent. on the hundred for collecting. Never take a note from a commission man, as it is a State's prison offense to sell on commission and refuse to pay over the money and keep it to do business with.

When sending the honey, give instructions as to what price you are willing to take for it, and if it does not sell for that, say you will not take less than a certain price, but to get all they can for it. We have never had trouble but once, and then we gave the case into the hands of good lawyers, and they had a few talks with the commission men, and told them they had committed a State's prison offense, and the commission men were glad to pay up without going to law with it. It cost us some \$30 to collect the \$550, but the lawyers threw off, in our case, ten or twenty dollars from their usual fee.

Write kind letters to your commission men occasionally, get their confidence, as it is to their interest to do business honestly. We never pay but 5 per cent. commission, and always send our honey by freight. We never had but two cases lost by railroad, and it was in due time paid for. At home we have to give 2 cents per pound for selling.

Roseville, • Ills.

Gleanings.

### Mr. James Heddon—Biography.

PROF. A. J. COOK.

I am very glad to accede to the request to give a brief account of the life and work of Mr. Heddon. True merit should always be rewarded; and as I am acquainted with no more able, thoughtful, studious, and hard-working bee-keeper in the United States than Mr. Heddon, it is with no little pleasure that I call attention to his life, his work, and to the valuable results of his careful experiments and thoughtful, studious labors in the apiary.

Mr. Heddon was the first specialist in bee-keeping in Michigan, and one of the first in the country, and thus his fertile, active mind has ever been directed toward the "pocket-book" side of bee-keeping; and so, as we should expect, all his work, experiments, and influence are in the spirit of this intensely practical age. Best of all, from a long and intimate acquaintance with him I feel assured that all his labor, both of hand and mind, has ever been impelled by an honest purpose and sincere desire to advance the vocation of his choice.

He was born in Genesee Valley, N. Y., Aug. 28, 1845. Thus he is now 42 years of age. In stature, Mr. Heddon is below the average, while his form is slight and wiry. He is extremely nervous, and has a keen, intense expression. He is gaunt and lean, because he has a twenty-horse-power nervous organism in a ten-

horse-power physique. His nervous tension and mental energy have always been vexed that their dwelling-house were not bigger and stronger, and are determined to destroy it; and it behooves our friend to look sharply or they will succeed.

Mentally Mr. Heddon is exceptionally vigorous and gifted. The Rev. Mr. Gage once told me that he was especially interested in a certain young man in his village, who with an opportunity, would certainly make a scientist. Years after, I became acquainted with this same promising young man in Mr. Heddon.

As a speaker, Mr. Heddon is unusually vigorous. His sentences are always to the point, and his figures and illustrations are often irresistible. I have known him at our State convention to hold every person spell-bound as he explained, often at great

He has had as many as 550 colonies of bees at one time, which were kept in three separate apiaries. He now has 450 in two apiaries. In 1877 his Glenwood apiary, worth \$1,500, and numbering 99 colonies, gave him a cash income of \$1,070, and increased to 207 colonies, all but two of which came through the following winter in good condition. The expense in caring for this apiary that year was \$200.

One year, with 16 colonies, he increased to 33, and sold \$800 worth of honey. All of the 33 colonies wintered well during the succeeding winter. At that time honey sold for a very high price. His largest yield for one season, of a single colony, was 410 pounds, all but 48 of which was extracted. He once secured 29 pounds and 13 ounces of unripe extracted honey as the result of a single day's gathering of a single colony.

His modification of the Langstroth hive, omitting the portico, the telescopic upper story and cover, and the bevel of the Simplicity, have so pleased me, after a two-years' trial, that I would never think to return to the old styles. Those who condemn, surely have never tried it. The shade-board is also much superior to a tree, evergreen or grapevine.

Like myself, Mr. Heddon used sections before he ever saw them elsewhere. Though original with us, their use in our apiaries may not have priority.

Mr. Heddon's shipping-crate, as I state in my book, is neat and cheap, and was the first substantial improvement in that article.

The section-crate, with bee-space above, will probably never be excelled in securing comb honey without separators. After two years' use I pronounce it simply perfection. It is in his new hive.

I have already reviewed his new book, and there spoke of his new hive and system. There can be no question of the originality of these, and hardly less that they are a marked improvement, and will soon come into general use. I have never tried these, but the experienced bee-keeper does not need to try every invention to be assured of its excellence.

Mr. Heddon has also practiced the principles of breeding, as followed by our successful breeders of other domestic animals; that is, he has crossed two valuable breeds, and by selection has secured a strain with the excellences of both the original races and without their undesirable qualities. He claims this; and while I have not tested his improved strain, I am certain that the above is the method which must be employed to secure the best bees.

Lastly, Mr. Heddon suggested the "Bee-Keepers' Union," which may and will be of great service to our industry. Each of us is liable to prosecution by those ignorant and prejudiced, and we need just such an organization to aid us in protecting our rights, and in maintaining the high position which our industry deservedly holds among the pursuits of the world.

Mr. Heddon has been President of the Michigan Association, and a very poor one he made. A President must be staid and serene, and without nerves, which does not describe our Dowagiac friend.

When at his house, some years since, among the many attractions I saw, were three beautiful children, those best ornaments in every home.

Agricultural College, 9 Mich.

length, his experiments, views and methods. The same spirited, forcible style characterizes his writings, as all who read the bee-periodicals know. His nervous energy, excessive love of fun, and desire for hard-earned victory, make him an eager controversialist. He fairly grows fat (mentally) in a good, square, honest, intellectual wrestle.

Mr. Heddon told me that he commenced bee-keeping with nothing except a stout heart. He has been a specialist all the time, except for a brief period of late, when he has sold supplies. This diversion, he has told me, was a loss to him. Now he is worth thousands of dollars. He went into the supply business in 1879, in hopes that, by a circular, he could answer many of the questions that now came to him in letters, and save time to his business. His present capital he credits almost exclusively to honey production.

Mr. Heddon is very neat and methodical. It is a very great pleasure to visit his place. I think I never visited an apiary where more taste and good judgment were displayed in all the arrangements of the bee-yard.

The valuable improvements which Mr. Heddon has given to our industry are many, and will most interest the readers of this sketch. All that I shall name, I feel certain are original; and nearly all I know to be excellent from actual experience.

I have found the slatted honey-board a very valuable adjunct to the Langstroth hive. This, when made just right, keeps the sections perfectly neat. The spaces must be just over the centre of the top-bars of the frames in the brood-chamber, and the spaces between the top-bar and slats no more nor less than a bee-space. This prevents the brace-combs, and such a honey-board needs only to be tested to be retained in every apiary.

[Mr. Heddon is well known the world over, as a successful apiarist who has thoughts and methods of his own, and that he is not afraid to express them, even if the multitude favor the opposite. His fort and special success lies in the direction of mechanical invention. Nearly all of his devices are practical, and will live after he is gone.—ED.]



MR. JAMES HEDDON, DOWAGIAC, MICH.

Translated from the French.

## Honey Necessary to Produce Wax.

G. DE LAYENS.

In making the experiments which I am going to describe, I have not made it a point to ascertain whether or not bees build their combs more economically with one kind of sugar than with another, my object having been simply to arrive at the quantity of honey used by bees working in an apiary at their free will, and at a season when they take to comb building with more readiness than in any other.

The experiments hitherto made in this direction differed so much among themselves that it was impossible to arrive at a reliable conclusion. It is this fact which induced me to recommence these experiments, taking for basis the various plans previously adopted. But at the very outset two questions arise which in practice have often been confounded, but which must be distinctly separated, viz.:

1. Even when honey is plentiful, it is not advantageous to induce bees to produce wax, although it may be done at a small cost, because, in the first place, if only a few empty frames are given to a strong colony among a good supply of ready-made combs, within which to store the incoming harvest, and yet to find sufficient scope to give vent to their comb-building propensity, they would be almost sure to build drone-comb. On the other hand, if plenty of comb building is given them by reducing them, as it were, to a combless colony, they would no doubt build numerous worker-combs, but they would not have sufficient cells wherein to store the incoming honey, the production of wax not being in proportion to the collection of honey. Therefore, at the time when honey is plentiful, it is not advisable to set bees to comb building.

2. When, on the contrary, the honey yield is great, is it advantageous to have bees produce wax? This is the point I have tried to solve.

The basis of what was considered to be the best experiments made consisted, briefly put, of selecting 2 colonies, say A and B, of the same strength, one of which—A, for instance—was supplied with empty frames, and the other, B, ready-built combs. A little later on, the honey gathered by B is weighed: the same with that found in A. This done, the quantity of wax produced is ascertained; the difference between the weight of the honey compared with that of the wax produced represents the proportion between the honey and the wax. This method is, however, incorrect in several respects.

1. Even supposing that by some chance one queen were as prolific as the other, they would not lay the same number of eggs within a certain number of days, because one of the hives afforded, from the very first day, all the desired accommodation for egg laying, which would not be

the case with the colony whose combs are built at a slow pace. Therefore, at the end of the experiment there will be more brood in one than in the other; hence a difference also in the consumption of honey, a difference which is left out of reckoning, and—

2. It was generally supposed that by choosing from an apiary 2 colonies, apparently of the same strength internally, and of similar activity externally, one could compare the work done by either of them without risk offering to any great extent; but very frequently this is not the case as I will presently show.

Having examined 2 colonies, which for the present purpose I will call No. 1 and No. 2, and having, moreover, ascertained that the strength of the latter was about twice that of the former, I reduced them both to the condition of a swarm. The bees, finding themselves now free to set about bringing in their harvest, under identical circumstances—for both colonies had been deprived of their brood—at the closing of each favorable day I used to take the exact weight of the honey brought in. No. 1 had stored kilos 2,140, and No. 2 kilos 2,030, that is, nearly as much as No. 1, whereas it ought to have gathered only about half that quantity.

This year Mr. Bertrand witnessed results similar to this, in the opposite direction. A colony of his had gathered kilos 87 of honey, whilst another, of about the same strength, had brought in, during the same interval, kilos 18. The question with me now is, not to find how to explain this, but rather to show that all experiments having for basis the simple comparison of actual work done by 2 colonies of the same strength cannot be relied upon.

I will now explain, therefore, what were the circumstances I placed myself in when I undertook my experiment.

1. My colonies had been allowed to work freely in the apiary, without interferences, so that nothing could be altered in the natural order of their duties.

2. My experiments were made at a season when temperature was high (maximum at least 20° Centigrade), this being the temperature which bees, in their natural state, choose for the production of wax.

3. I had also selected for my experiments a season when honey was rather scarce, so as to be sure that the colonies which were building, as well as those which were not, had sufficient room in their combs for storing all the honey they could bring in.

4. I experimented on 2 colonies in my apiary which differed in strength as well as in quantity of brood, but which, judging from external appearance, both worked with about the same amount of energy.

Now, these 2 colonies, which I will here call A to the strongest, and B to the less strong, were both reduced to the condition of a swarm. To A, seven built frames were given, between which I inserted empty ones. This I did in order to feel that the bees were obliged, as it were, to build,

and that at the same time there was a sufficiency of built-combs to receive the incoming honey, and that, moreover, the egg-laying propensity of the queen would not be checked for want of room. To B, I gave eight ready-built frames; here the bees could not build combs for want of space.

5. I made two experiments, one after the other, and each one lasted exactly eight days. At the end of the eighth day all the combs were taken away from the hives and replaced by others, but the order was reversed; here, then, B was placed in the necessity of building combs, whereas A was prevented from doing so. This crossing system is an important one, as it permits, whilst experimenting on any two hives, of obtaining data for comparing, by simply adding, at the end of the experiment, the differences which are noted between them.

6. At the conclusion of the experiments, the honey collected by the colonies A and B (which did not make any wax) was added together; so was also the honey of the colonies A and B (which made wax). Lastly, the quantity of wax made by the 2 colonies was added together. Owing, however, to great dampness, the honey gathered during the sixteen days of the experiment contained a considerable quantity of water, consequently at the end of the time none of the cells had been sealed up. The honey, which was very thin, contained, therefore, more water than that in the sealed-up cells. In order to neutralize this misleading circumstance, I ascertained the thickness of the sealed-up honey as well as that of the thin liquid one (honey) which had just been brought home. This done, I added a sufficient quantity of water to the honey which had been sealed up by the bees, until it had been brought to the same degree of thickness of that which had not been sealed up. By these means I was enabled to arrive at the extra quantity of water contained in the honey which had just been gathered, and I deducted this quantity of water from my calculations. Finally, the difference in quantity of honey gathered by the colonies which built combs and that of those which did not build, indicated the weight of the honey consumed in the production of a given weight of wax.

7. During the sixteen days my experiments lasted, the queens did not lay a uniform number of eggs, as they were not of identical fecundity. Nor did it happen that during the same period the laying of eggs by these two queens did progress with the same disproportion; as a result of this, in the colonies which had not been building, 16,064 eggs were laid, whereas in those which had been building, the number of eggs laid was 16,634, or as near as possible the same number. This small difference of brood represents a quantity of honey consumed the weight of which must be added to that gathered by the colonies which had been building comb. But as the eggs did not open until the end of three days, and that it was only then that they began consuming honey,

the number of larvae which had been fed was 358. It is the honey consumed by these that must now be arrived at.

According to the investigations made by Berlepsch, 47 grammes of honey and pollen would have sufficed to feed these 358 larvae until they closed themselves up in their cell. Other experiments, made by myself, show that to feed their brood bees use about as much honey as pollen, consequently 25 grammes will be the maximum quantity of honey used up by my bees in the partial feeding of this brood, of which only a few cells were sealed over.

We find, therefore, that the difference in the quantity of honey gathered was one kilo and 202 grammes. That of wax produced 191 grammes. My bees had, therefore, used 6 grammes, 3 of honey in order to produce one gramme of wax.

In previous experiments my bees had started comb-building on eight frames, and as the honey yield was an indifferent one, with the exception of the first day, they built almost worker comb throughout—I say almost, or nearly so, because in a corner of the largest comb there were to be found a few drone-cells; the latter had been built the first day, when the honey yield was greatest, almost two kilos having been brought in.

It will be seen, therefore, that in practice it is possible to get bees to build worker-combs rather economically by feeding them with a cheaper kind of honey, say some of the foreign kind, to be had on the Havre market at from 50 to 60 francs the kilos. But, to obtain this result, three things are essential, viz :

1. A rather poor yield of honey.
2. The removal of all the brood-combs of a hive, to be replaced by empty frames, the latter to be placed between the full ones. The brood-combs removed, will be given to a weaker colony.
3. Never to induce comb-building unless when the temperature is high.

Plowman.

### A Plea for Better Bee-Keeping.

C. H. DIBBERN.

While I am free to admit that much has been accomplished in the past twenty years to place this industry on a higher plane, yet we cannot shut our eyes to the fact that very much still remains to be done.

Perhaps the best way to get an idea of the present condition of bee-keeping, is to visit some of our large towns, and inspect the honey offered for sale by dealers. I made such a visit recently, and this is about how I found things :

Calling at a large grocery house I inquired if they had any comb honey. I was assured that they had some that was very nice, and followed the clerk in the back room, was shown some boxes apparently made from old fence boards, without planing. The honey was of good quality, but in sections about 7 inches square, and made of material varying from  $\frac{1}{4}$  to  $\frac{1}{2}$  of an

inch thick. They had not been scraped of propolis, and some of them had evidently been used a number of years. It was easy to see that no separators had been used to compel the bees to build straight combs, as it was very much bulged, and in handling and shipping some of the combs had got jammed together, or the cappings were scraped off in trying to get the sections out, and the cases were leaking all over the floor. When I objected to the honey on the above grounds, I was told that it could not be helped, that the honey was all right and clean, and that the people did not eat the boxes, anyway.

The next place I visited, I found some California honey in Harbison sections. This was nice and white, but it had evidently been roughly handled. A dozen crates were piled upside down in a tub, and were leaking a good deal, as the 2 or 3 inches of honey (and flies) in the bottom of the tub testified. I objected to this as not being what I wanted, and they then told me they were disgusted with the honey-trade and thought of giving it up.

Next I tried the much-abused commission man, and, seeing a large pile of nice, new crates with some very fine honey showing through the glass, I thought, "now I had found honey that I would find it hard to find fault with." Getting into conversation with the man in charge, he kindly showed me around, and on my request looked into several shipments. The first lot was of one-pound sections, in nice, new cases. Opening a case, the honey was nice and straight in white-wood sections, cleaned of every particle of propolis, and the sections resting on little strips of wood, placed inside of little paper pans in the bottom of the case, to catch any dripping honey, but there did not seem to be any.

"These ten cases," said the man, "are all we have left of a hundred cases that came in yesterday morning, and it has all been sold at 15 cents per pound." I remarked to him that it seemed to be a fancy price, that the papers only quoted white clover honey at 10 and 11 cents. "That is very true," said he, "but this is what we call a fancy article, and the name of the producer is on every case, and he is a man that we can depend on, every time. Here is a lot that has been here for a month from a neighbor of his that appears to be just as good, but please open a case and see." I did so, and found the honey nice, only on the outside next the glass. Back of this were a lot of dirty looking sections, filled with all kinds of honey from white clover to "honeydew." The combs were bulged, and had the cappings more or less damaged by slapping together in shipping.

"These 17 cases are what remain of 20 we received a month ago. We have tried hard to sell it, too, but if we sell 5 cases we generally get back 4 of them. We are now offering it at 8 cents, and I am sure when our account sales of this lot is rendered, we will be roundly denounced as scoundrels."

Who is the scoundrel?

Just now we hear much about the depression and low prices of honey. Many are discouraged, and talk of trying something else. Well, perhaps the sooner the careless or the dishonest leave the pursuit the better. Talk about establishing a uniform price for honey! how can it be done when there is so much difference in quality, style of packing, and "honesty" of grading. I myself could have sold, during the past season, thousands of pounds of choice honey for other bee-keepers, could I have depended on getting such honey as would fill my orders.

Now, bee-keepers, as another season is just commencing, let us all form new resolutions. Let us determine to have only the best. We want the most convenient hives, both for us and the bees. We want nice, handy cases on the hives. We want to throw away all old, soiled sections—it will not pay to use them when we can buy new ones so cheap. We must use separators of some kind to secure nice straight combs; in fact we must determine to have everything the very best, and then there will be no trouble to sell the honey.

Milan, &c IIs.

### Language of Bees—Old Testimony.

REV. JOHN THORLEY.

As to the time of second swarms, we generally fix it to a day or two, and know when to expect them, by means of those distinct, peculiar, and musical notes, which are always heard two or three days before they rise.

Bees certainly have a language among themselves, which they certainly understand, though we do not, or at best, very imperfectly. Eight or nine days after the prime swarm is departed, one of the young princesses, addressing herself in a very humble and submissive manner to the queen-mother, petitions for leave to withdraw, and erect a new empire, with a select body of the populace.

The regent for a time seems silent, and for a day or night there is no answer, nor any grant given; however, the young princess, bent on crown and kingdom, continues her suit, and at last succeeds. The second night you may hear the queen, with a very audible voice (being an eighth) giving her royal grant, and proclaiming it (as by sound of a trumpet) through the whole kingdom. Her voice is a grant, her silence a denial. And the day following, the weather being tolerable, you may expect the swarm. It is delightful to attend to those peculiar sounds or notes, being an eighth chord, which is truly harmonious. Dr. Butler has taken pains to show us the compass the song contains in the gamut, or scale of music; the queen composing her part, or bass, within the four lower cleffs; and the princess hers, a treble, in the four upper cleffs. The swarm ready to come fourth, the notes are louder, quicker, and more constant. When the greater part of the swarm is out, the music is at an end, and we hear

no more. Sometimes the royal grant is revoked, and then all the royal issue are slain.

As every general rule has an exception, I must tell my reader that on June 2, 1716, after a swarm came out, that very evening and the two following, they gave notice for a second swarm, which rose the fifth day, when I joined them to the first. That night and the next, they called as before, and rose twice; I returned them both times, at each taking a queen from them. A few days after, they rose a third time, settled, yet went home again. Finally, they rose a fourth time, when I took two queens from them, putting them back to the old colony, after which they came forth no more. I mention this as being very singular, and what I never observed before nor since.

I perfectly remember, though many years ago, I heard these previous notices given for a first swarm, which are exceedingly rare (that being the only time I ever took knowledge of them), and in a colony too; where placing my ear close to the top of the uppermost box, I could very easily and distinctly hear the least noise, and what was acting about the throne. And just as the swarm began to rise, there seemed to be the greatest lamentation among the branches of the royal family. Notes of woe expressive of the deepest sorrow, as though they were taking an eternal farewell of one another. It was really in some measure moving and affecting.

I could resemble it to nothing better, than to the dearest relations, and most loving faithful friends taking a final leave of each other, with the tenderest, most affectionate embraces, and with floods of tears. But to return.

With the second swarm, two of the royal princesses go forth very often, and sometimes three, in hopes to gain a kingdom. That princess, who is so happy as to get the throne first, is proclaimed queen, and crowned; the rest are all slain, as I have found them the next morning.

England, A. D. 1740.

For the American Bee Journal.

### The Uses of Beeswax.

HORACE BANKS.

DEAR EDITOR:—A few weeks since I found the following article on the above subject, taken from an old copy of the New York *Grocer*, where it was headed, "A chapter on wax; its uses for manufacturing and artistic purposes—extent of its production, etc." I think it will be interesting to many of your readers, and hope to see it in the AMERICAN BEE JOURNAL. Here is that portion of the article relative to the uses for beeswax:

"The uses for wax are numerous and important. Its property of preserving tissues and preventing mold or mildew was well known to the ancients, who used cere-cloth for embalming, and wax for encaustic paint-

ing, as in the wall pictures of Pompeii. Wax candles and tapers play an important part in the processions and ceremonies of the Roman Catholic church. Wax is used by the manufacturers of glazed, ornamental and wall papers, and on paper collars and cuffs for polishing the surfaces. It is used in varnishes and paints, and for the "stuffing" of wood which is to be polished, as for pianos, coach work, fine furniture, and parquet floors.

"Electrotypes and plasterers use wax in forming their molds. Wax is an important ingredient in preparations for covering surfaces of polished iron and steel to prevent rust. Combined with tallow, it forms the coating for canvas and cordage to prevent mildew, as in sails, awnings, etc. Artificial flowers consume much wax, and, despite the introduction of paraffine, ceresin and mineral wax, its use appears to be extending. One of the oldest of its applications is in the laundry, and in polishing wood-work. The wax-product in the United States is stated to be 30,000,000 pounds annually, and increasing—worth in money at least \$6,000,000. Of this about \$700,000 worth are exported, and about \$1,200,000 worth of honey also goes abroad. The total product of honey and wax is worth at present in the United States nearly \$15,000,000."

These figures on the honey crop are now very much enhanced, and I leave it for you, Mr. Editor, to give us the latest statistics.

Baltimore, & Md.

[The annual honey crop is about one hundred millions of pounds, and its value is probably about ten millions of dollars. This would give for the annual value of the production of honey and beeswax, about sixteen millions of dollars.—ED.]

Read at the Vermont Convention.

### How and Why Plants Produce Honey.

PROF. W. W. COOKE.

Self-fertilization takes place where the seed-vessel and pollen are together on the same flower, and come in contact, and cross-fertilization occurs when pollen from one flower is carried to the seed-vessel of another flower. The reasons why nature desires to cross plants is to secure greater height, weight and vigor, and more seeds. Most plants are spoiled by self-fertilization, the same as close breeding in animals; some plants usually self-fertilize, as the pea, lettuce, onion and ground-nut; but large, new varieties of peas are obtained by cross-fertilization. The means whereby nature obtains cross-fertilization are three, wind fertilization as in grasses; insect fertilization as in most flowers; as in honey-suckles. The prepotency of the pollen from another plant over that from the plant itself, is among the curious features of plant life. Plants also obtain cross-fertilization by having

the pollen and seed-vessels on separate plants, as in the case of willows. On separate parts of the same plant, as in corn when in the same flower it is attained by having pollen ripe before the seed vessel, or vice versa, as in the plantain, fire-weed, gentian and verbena. There must be some great benefit in cross-fertilization to offset the great waste of valuable pollen in some flowers, and small, closed flowers of violet have 100 grains, while the peony has three and one-half million grains.

In relation to the means taken by nature to entice insects to plants, it is to be noticed that wind-fertilized plants are dull in color, destitute of odor, and contain no honey, as in the case of pines and all conifers, hemp, hop, and grasses. Large conspicuous flowers are visited much more frequently, and by a greater variety of insects than small inconspicuous ones. Bees probably distinguish flowers by bright-colored leaves. When bright blue flowers were cut off in an experiment, bees crawled over to get other flowers. When the small upper leaves, which bees do not use to stand on, were cut off, the bees visited the flowers as usual. Odors attract insects, as shown by flowers covered with a muslin net. When possessed of odor they do not so much need color. Fourteen per cent. of white flowers have a sweet odor, while only 8 per cent. of red ones have it. Honey was certainly put in flowers to entice insects. When the honey-sac was cut off a large number of flowers, more than half of them were not visited by insects, and produced no seed. Even dark colored streaks on colored leaves of flowers are believed to be for guiding the insect to the honey-sac, so that it can suck a greater number of flowers in a given time, and hence produce more perfect cross-fertilization. As honey is of use to plants only as it helps to cross-fertilize them, it is always placed where it will aid in this.

When mature, the pollen-vessels and the seed-vessels always stand in the pathway leading to the honey-sac. A certain amount of heat is necessary for the formation of honey. With some flowers, if the sun ceases to shine for half an hour, bees will cease to work on them for lack of honey. In most plants, the construction and position of the pollen-glands and the seed-vessels are evidently arranged with the evident intention of making the bees rub against them when it seeks the flower for honey. In such cases the pollen is moist or glutinous. In wind-fertilized plants the pollen is dry and powdery, and the seed-vessel is usually sticking out and hairy to catch the pollen.

Many flowers are irregular, one or more leaves flattened to serve as a landing place for the bee, and their honey-sac is on that side of the flower. Violets have large conspicuous flowers adapted to cross-fertilization, and these flowers are very fragrant, and have much honey. In the harebell the honey-sac is at the bottom of the bell. The pollen-vessels open first and shed pollen into the bottom of the

bell around the honey-sac. The seed-vessel remains closed. Several days later, when the pollen is dead, the seed-vessel opens and receives pollen from other flowers. In the daisy, one head has many flowers. The outer white leaves serve as an attraction and resting-place, and produce no pollen. Inner flowers have pollen-vessels in the form of a hollow tube, into the middle of which the pollen falls, and is pushed up and into view by the tip of the seed-vessel. Afterward, when the seed-vessel is full grown, and most of the pollen has been brushed off, the top opens and exposes the inner face to the seed-vessel to pollen brought from other plants.

In a common garden-bean, the stamens shed pollen on the middle of the style. One of the flower leaves is wound into a tube containing both stamens and style. These remain inside the leaf until a bee alights on the wing petals, then its weight presses down the blossom, and first the end of the style touches the bee and it gets any pollen which it has brought from the last-visited flower; next the style sticks out still further, and the pollen on its middle hits the same spot and prepares the bee for the next flower.

In the lady-slipper the honey-sac is at the bottom of the slipper. The bee enters the large slit on the upper side of the slipper. Edges are inflexed so that the bee cannot creep out the same way. There are two small holes near the stalk through which it can get out. In doing so it must brush against the seed-vessel and pollen-masses. If the pollen-masses were first, the plant would be self-fertilized, but in fact the seed-vessel comes first and pollen is carried off to be left on the stigma of the next flower it enters.

Orchids have a sticky material that will set at once; as soon as the insect's head touches it, the honey is free in the sac. When the sticky material requires more time to harden, the honey-sac is empty and the honey is contained in the lining of the sac, and the bee has to bore through the wall of this lining in several places before it can get all the honey.

Bees have habits which help cross-fertilization. They work on flowers of one kind as long as they can before changing to another kind. This is not to help the plant, but because they have learned how to stand and work better. Bees search for honey by instinct, by experience, since they work as soon as they emerge from the pupa state. They search introduced plants as readily as native flowers which do not secrete honey, and often try to suck honey out of the honey-sacs that are too long for them to reach. Bees cannot tell without entering a flower whether other bees have exhausted the honey, and hence the flower is more perfectly cross-fertilized. Mr. Miller found that in a certain set of blossoms visited by a bumble-bee, four-fifths had been previously visited.

The great number of flowers which bees can visit in a short time greatly

increases the chances of any given flower being cross-fertilized. In one minute a bumble-bee visited 24 of the closed flowers of flax. In 15 minutes a single flower on the summit of a plant of evening primrose was visited eight times by various bees. In 19 minutes every flower on a certain flowering plant was visited twice. In one minute six flowers of a harebell were entered by a pollen-collecting bee, for when collecting pollen they work more slowly than when collecting honey. It was estimated at one time that the flowers in a certain flower-bed were each visited 30 times daily during the week or more that they were in blossom. Bumble-bees in collecting honey fly at the rate of ten miles an hour.

Bees have other habits which are directly opposed to cross-fertilization. In flowers having several honey-sacs, if a bee finds the first one it searches it empty, it does not wait to search the others. Bees often get the honey by biting holes in the blossoms and sucking it out of the side. Whole fields of red clover have been examined in which every flower was thus bitten. The biting is done by bumble-bees, and then hive-bees suck through the holes. Bees are very successful in thus biting holes, always hitting the spot outside just over the honey-sac. In all such cases the plant is not fertilized.

The facts are that plants are very thoroughly fertilized by insects. A gentleman marked 310 plants which were incapable of self-fertilization, and carefully put pollen on the stigmas of each day after day; he left an equal number to the insects. His produced 11,237 seeds, and the bees 10,886, a difference of but one in 35, and this difference is fully made up by the fact that he worked during a cold spell with continued rain, when the bees did not. Of white clover, 10 heads unprotected gave nearly ten times as many seeds as 10 heads covered with gauze; 20 heads covered produced only one poor seed, and 20 heads open gave 2,290 seeds. Of red clover, 100 heads covered gave nothing, and 100 heads open produced 2,720 seeds. Insects will abundantly cross-fertilize plants growing one-third to one-half mile apart.

In the United States, hive-bees never suck red clover. In England they only suck it through holes made by bumble-bees. The clover cannot be fertilized by the hive-bee—it is too small—but it is cross-fertilized by the bumble-bee. Hence one gentleman has made this statement: The safety of England depends on the number of cats she keeps. He proves his proposition thus: Without the aid of bumble-bees the red clover could not be fertilized. Bumble-bees make their nests on the ground, where they are the prey of mice. Cats destroy the mice and give the bees a chance to live. Hence he reasons, no cats, many mice; many mice, no bumble-bees; no bees, no clover; no clover, no cattle; no cattle, no beef; and without beef where would the Englishman be?

University of Vermont.

### Local Convention Directory.

#### 1887. Time and place of Meeting.

May 27.—Darke County Union, at Greenville, O.  
J. A. Roe, Asst. Sec., Union City, Ind.  
Dec. 7-9.—Michigan State, at East Saginaw, Mich.  
H. D. Cutting, Sec., Clinton, Mich.

**ED** In order to have this table complete, Secretaries are requested to forward full particulars of time and place of future meetings.—ED.

### SELECTIONS FROM OUR LETTER-BOX

#### Discussion on Marketing Honey.

—Dr. C. C. Miller, Marengo, Ills., writes thus on May 17, 1887:

**FRIEND NEWMAN:**—In reply to your suggestion on page 275, the matters mentioned for discussion are certainly important, and have awakened so much interest, that in the absence of any objection we may consider it *settled* that they will be taken up for discussion at the convention of the North American Bee-Keepers' Society at Chicago, next fall.—C. C. MILLER.

[This settles it then, that at the next meeting of the North American Bee-Keepers' Society at Chicago, there will be a full discussion of these topics, viz: "The cost of production, prices at which honey can be sold at a profit, methods of putting up honey, commission men, cash buyers, home markets, city markets, foreign markets, development of markets, distribution of our products, associations, corners, etc." Let all prepare to exhaust the subject.—ED.]

**White Clover in Bloom.**—Wm. Robson, Rolla, Mo., on May 10, 1887, says:

White clover is beginning to make pastures look white. We have plenty of rain now, and bees are tumbling over each other in their work.

**Bee-Keeping in Florida.**—Dr. Jesse Oren, La Porte City, Iowa, on May 12, 1887, writes:

I would say in regard to Mr. O. O. Poppleton's bees, that he had but one colony left on March 30. But his loss was a gain! How? In this way: Mr. Sheldon, of New Smyrna, Fla., gave him 100 colonies with honey enough to carry the bees over the summer of 1887! Mr. Poppleton is to return the colonies at the end of the year, Mr. P. to get all the *proceeds*, whatever that may be. Now, as Mr. Sheldon has furnished all needed honey to feed, Mr. P. will utilize all his combs and be ready for next year's mangrove bloom, if nature brings them out. Florida is no bee-State like Illinois and Iowa—but is a poor State for bees.

**Sound of Bees in Winter.**—Elias Fox, Hillsborough, Wis., on May 12, 1887, says:

I would say in reply to Mr. Demaree, that years ago, when my father kept bees in box-hives and wintered them on the summer stands, so far as the sound was concerned during the cold weather, one would have said they were dead; but the sound returned with the warm weather. The same is demonstrated even after bees are removed from the cellar. When the mornings are cool, we cannot hear a sound, but as soon as the mercury gets up to about  $40^{\circ}$  or  $45^{\circ}$ , we will hear the humming commence.

**Clover Blooming.**—Jos. M. Brooks, Columbus, Ind., on May 14, 1887, writes:

My bees are in good condition, but are short of stores. The clover is commencing to bloom.

**Noise of Bees in Winter.**—Thos. A. Anderson, Big Spring, Mo., on May 12, 1887, says:

In 1884, 1883 and 1882 I wintered bees out-doors—in 1883 and 1882 with single stories covered with quilts, and the second story filled with sawdust (10-frame Langstroth hives); in 1884, in single stories without any protection (I use honey-boards); and invariably when the mercury reached  $10^{\circ}$  below zero, and lower, they could be heard 10 feet and further away, and wintered well.

**Extracted Honey.**—J. M. Shuck, Des Moines, Iowa, says:

What shall we call it? Honey by any other name would taste as sweet, but there is a difference among the "craft" as to what we should name it. My position is that it needs no "ear-marks," so to speak. Call it "honey" and be true. It is honey in its purest form. Let our market reports quote "honey" at so much per pound, and "comb honey" at its market value, and all will be understood.

**Legislation on Priority of Location.**—Dr. C. C. Miller, Marengo, Ill., writes:

I am at present a bee-keeper rather than a writer, and have only time for a word in reply to Mr. Clarke. Whatever deductions he may have made (and I cannot so much wonder at his misunderstanding my position, since so many others did so), the fact still remains that I never desired legislation in favor of priority of location, nor advocated it, and after having repeatedly and emphatically said so, (as quoted by Mr. Clarke himself), it seems to me that he might have accepted as my true position that which I gave in plain words that could not well be misunderstood, rather than to still cling to his previous misunderstanding.

**Bees Building up Fast.**—O. P. Miner, Taylor Centre, N. Y., on May 12, 1887, writes:

The mortality among bees in this section has been about 30 per cent. The members present at the Cortland Union Bee-Keepers' Convention, on May 10, reported 640 colonies left out of 916, last fall; with many of them weak. Those in chaff hives and cellars have suffered in about the same ratio. My own loss was 3 colonies out of 10 in chaff hives. Last spring my bees gathered the first pollen on April 14, and this spring on April 26. They are now building up quite fast, and bee-keepers anticipate a more favorable season for honey than the last was.

**Honey Crop a Failure for 3 Years.**—C. M. Davis, Denison, Tex., on May 15, 1887, says:

Bees are doing quite well. We have had frequent rains, and the prospects are good for a harvest of honey; the farmers say crops never looked better. The honey crop in northern Texas has been a failure for 3 years.

**No Roaring in Winter.**—J. F. Latham, Cumberland, Me., on May 16, 1887, writes:

I have always wintered my bees on the summer stands, and I have never known them to "roar" or make any perceptible noise during the coldest weather—in my eight years of bee-keeping.

**Bees in Splendid Condition.**—N. Staininger, Denison, Iowa, on May 5, 1887, writes:

All of my 81 colonies of bees wintered splendidly, 70 full colonies coming out strong and healthy, and 11 nuclei; one colony starved, 3 queens were lost, and all of the balance are in good condition. I have plenty of drones flying, and some colonies have queen-cells started, with 8 frames of brood. The temperature was at  $40^{\circ}$  to  $45^{\circ}$  all winter. I expect a good honey harvest, if we get rain soon.

**Heard the Bees Roaring.**—James Irwin, Columbus Grove, O., on May 19, 1887, says:

I wintered my bees on the summer stands with but little protection, with a temperature ranging from zero down to  $15^{\circ}$  below, and I could hear them roaring from 8 to 12 feet from the hive.

**Winter Losses of Bees.**—Mr. Wm. Cleary, Algona, Iowa, on May 12, 1887, writes:

On page 123 I wrote that I was wintering 27 colonies, and that I weighed them when put into the cellar on Nov. 16, 1886, and weighed them when put out on April 7. They shrunk in weight about  $4\frac{1}{2}$  pounds each on the average, but the dead bees were in

the hives yet. I lost 7 colonies, 4 in the cellar, and 3 out of 4 in tenement hives. They are breeding up fast now, and have gathered considerable honey. Almost all the bees in this county died the past winter. One man lost 54 colonies out of 60; another lost 40 colonies—all he had—and several others lost all they had. I saved the best per cent. of any one in this county.

### Honey and Beeswax Market.

The following are our very latest quotations for honey and beeswax:

#### CHICAGO.

**HONEY.**—Sellers ask from 7 to 10 cts. for anything off in comb honey; this includes dark undesirable and crooked combs, and 2-pound sections. Good 1-lb. sections, 10@12c.; choice, 12@13c.  
**BEESWAX.**—25c. R. A. BURNETT,  
Mar. 28. 161 South Water St.

#### Detroit.

**HONEY.**—Best white comb, 11@12c. Market is nearly bare, awaiting the new crop.  
**BEESWAX.**—23@24c.  
May 11. M. H. HUNT, Bell Branch, Mich.

#### SAN FRANCISCO.

**HONEY.**—We quote: Extracted, white, 4@5 cts.; light amber, 4@5c.; amber, 4@5c. Comb, white, 12@14c.; amber, 7@8c. Demand good.  
**BEESWAX.**—23c.  
May 8. SCHACHT & LEMCKE, 122-124 Davis St.

#### CLEVELAND.

**HONEY.**—Choice white in 1-lb. sections, 12@13c.; second quality, 10@11c.; and buckwheat unsalable at 8@9c. Extracted, 5@6c.  
**BEESWAX.**—25c.  
Apr. 30. A. C. KENDEL, 115 Ontario St.

#### ST. LOUIS.

**HONEY.**—Choice comb, 10@12c. Strained, in barrels, 3@4@4@5c. Extra fancy, 1@ more than foregoing prices. Extracted, 4@5c. Market dull.  
**BEESWAX.**—Steady at 20c. for prime.  
May 20. D. G. TUTT & CO., Commercial St.

#### SAN FRANCISCO.

**HONEY.**—We quote: White comb, 12@14c.; amber, 7@8c.  
Extracted, white, 4@5c.; light amber, 5@6@7c. Market quiet.  
**BEESWAX.**—18@21c.  
May 14. O. B. SMITH & CO., 423 Front St.

#### MILWAUKEE.

**HONEY.**—We quote: Finest white 1-lb. sections, 12@12@14c.; choice white 1-lbs., 11@12@13c.; choice 2-lbs., 10@11c.; dark not wanted, and imperfect slow. Extracted, finest white in kegs, 6@7c.; good white in kegs and barrels, 6@7c.; dark, 4 to 4@5c. Demand good and market firm.  
**BEESWAX.**—25c.  
May 4. A. V. BISHOP, 142 W. Water St.

#### NEW YORK.

**HONEY.**—We quote: White comb, 9@12c.; dark 5@7c. California comb, 8@9c.; extracted, 5@6c. Sales large and demand good.  
**BEESWAX.**—23@24c.  
May 10. McCALL & HILDRETH BROS., 28 & 30 W. Broadway, near Duane St.

#### KANSAS CITY.

**HONEY.**—We quote: White clover 1-lbs., 10@12 cts.; dark, 9 to 10c. White clover 2-lbs., 10 to 11c.; dark, 9 to 10c. Extracted, 5 to 6c. in small way. Very little extracted in the market.  
May 16. CLEMONS, CLOON & CO., cor 4th & Walnut

#### BOSTON.

**HONEY.**—1-lb. packages of white clover honey at 13@15c.; 2-pounds at 11@13c. Extracted, 5@7c. Sales slow.  
**BEESWAX.**—26 cts. per lb.  
Apr. 22. BLAKE & HIPLEY, 57 Chatham Street.

#### CINCINNATI.

**HONEY.**—We quote for extracted, 3@7c. per lb. Best comb brings 11@14c. per lb. Demand fair.  
**BEESWAX.**—Good demand, 20@23c. per lb. for good to choice yellow.  
Apr. 21. C. F. MUTH & SON, Freeman & Central Av.

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**To Correspondents.** — It would save us much trouble, if all would be particular to give their P. O. address and name, when writing to this office. We have several letters (some inclosing money) that have no name; many others having no Post-Office, County or State. Also, if you live near one post-office and get your mail at another, be sure to give the address we have on our list.

**Dr. Miller's Book**, "A Year Among the Bees" (75 cts.), and the **BEE JOURNAL** for one year (\$1.00), both of which we will club for only \$1.50.

**The Convention History of America** with a full report of the proceedings of the Detroit and Indianapolis conventions, and the **AMERICAN BEE JOURNAL** for one year, will be clubbed for \$1.25.

**As there is Another** firm in Chicago by the name of "Newman & Son," we wish our correspondents would write "American Bee Journal" on the envelope when writing to this office. Several letters of ours have already gone to the other firm (a commission house), causing vexatious delay and trouble.

**We will Present** Webster's Dictionary (pocket edition), and send it by mail, postpaid, for two subscribers with \$2. It is always useful to have a dictionary at hand to decide as to the spelling of words, and to determine their meaning.

**Yucca Brushes** are employed for removing bees from the combs. They are a soft, vegetable fiber, and do not irritate the bees. As each separate fiber extends the whole length of the handle as well as the brush, they are almost indestructible. When they become sticky with honey, they can be washed, and when dry, are as good as ever. The low price at which they are sold, enables any bee-keeper to have six or more of them, so as to always have one handy. We can supply them at 5 cents each, or 50 cents a dozen; if sent by mail, add 1 cent each for postage.

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**The Large New Office** and warehouse of W. H. Fay & Co., manufacturers of Fay's Manilla Roofing and Carpeting, Camden, N. J., was entirely destroyed by fire last night. With commendable energy they have gone to work and secured temporary quarters, and are to-day ready for orders. Fortunately these gentlemen have a very large stock at their factory, which is in another portion of the city, and they assure us that their patrons and agents throughout the land will receive their goods as promptly as though no fire had occurred.—Philadelphia, May 14.

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Success to the little book of fresh and live ideas.—E. E. Hasty, Richards, O., March 28, 1887.

It is the best book on the production of comb honey I ever read.—F. W. Holmes, Coopersville, Mich., March 29, 1887.

I congratulate you on getting up such a complete treatise upon the subject in so small a book.—W. H. Shirley, Mill Grove, Mich., March 27, 1887.

Your little work on "The Production of Comb Honey" is a valuable acquisition, and coincides with my experience.—Dr. L. C. Whiting, East Saginaw, Mich., April 23, 1887.

It is simply at the head, in every respect, so far as it goes. All can say that there are larger books—those that cover more ground, but none that cover their ground nearly as well.—James Heddon, Dowagiac, Mich., April 2, 1887.

You have given us a valuable work. Though terse, it lacks nothing in completeness. We need more such books—those that give facts in the fewest words. For four years I have practiced essentially the system you give, and know its superior worth.—Dr. G. L. Tinker, New Philadelphia, Ohio, April 17, 1887.

Your book received last night and read through before I could sleep. To be sure I knew the most of it from your articles in the bee-papers, but it is nice to have it all together in a neat little book like yours. You just more than boiled it down, didn't you?—Dr. A. B. Mason, Auburndale, O., Mar. 29, 1887.

Friend H.: Have just received your little book. Much that it contains will be found new, I think, with the majority. The cost in production must in some way be lessened. You set out the primary elements by which such lessening of cost may be made. I say heartily that I think your little book should be studied carefully by every producer of comb honey. With kind regards—J. E. Pond, Foxboro, Mass., March 28, 1887.

Your lovely little book gave sister and me much pleasure, and the author will please accept many thanks. Since criticism is invited, permit me to say that we reach the conclusion to soon. Had the book been less interesting we might not have discovered the fault—might even have thought it a merit—and since the book is as good as it is pretty, its brevity is a serious fault; a fault which will surely be amended in the second edition.

With the hope that it may everywhere receive the cordial welcome that it merits, I am yours truly—"Cyrus Linuswic."

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Patented June 22, 1881.

We will furnish you SECTIONS as cheap as the cheapest. Write for price-list. Watertown, Wis., May 1st, 1887.

Thos. G. Newman & Son, of Chicago, sell the one-piece Sections manufactured by us.

## 100 Colonies of Italian Bees,

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1880.

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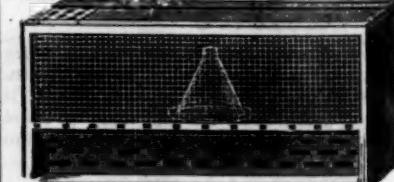
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High Side Walls, 4 to 14 square feet to the pound. Wholesale and Retail. Circulars and Samples free

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Dadant's Foundation Factory, wholesale and retail. See advertisement in another column.